

What is claimed is:

1. A linear guide apparatus comprising:
  - a plurality of rolling elements;
  - a guide rail having a first ball rolling groove for the
  - 5 rolling elements formed on each widthwise opposite surface;
  - and
  - a slider including a pair of leg portions respectively
  - disposed on widthwise opposite sides of the guide rail, and
  - a horizontal portion disposed on one thicknesswise end side
  - 10 of the guide rail and connecting the leg portions, each of the
  - leg portions having a second ball rolling groove provided on
  - an inner side surface and disposed in face-to-face relation
  - to the first ball rolling groove of the guide rail where a ball
  - rolling path for the rolling elements is formed by the first
  - 15 ball rolling groove and the second ball rolling groove, a return
  - path for the rolling elements, and a pair of direction changing
  - paths for allowing the return path and the ball rolling path
  - to communicate with each other,
  - wherein one of the guide rail and the slider linearly
  - 20 moves relative to another one thereof as the rolling elements
  - roll in a circulating path, the circulating path being formed
  - by the ball rolling path, the return path and the direction
  - changing path,
  - wherein the slider includes a metallic main body, a
  - 25 synthetic resin-made frame which is detachably fitted to outer

sides of the main body, and a pair of synthetic resin-made end caps which are fixed to the main body through the frame,

the frame including a pair of outer legs each constituting a widthwise outer portion of the leg portion, and a pair of frame horizontal portions each constituting an opposite end portion, as viewed in a linearly moving direction, of the horizontal portion, each of the outer legs having the return path, an inside groove of the direction changing path and a first protrusion provided on an inner side of the outer leg,

the main body including a pair of inner legs each constituting a widthwise inner portion of the leg portion and a main body horizontal portion constituting a major portion of the horizontal portion, each of the inner legs having the second ball rolling groove and a first recessed portion

corresponding to the first protrusion of the frame provided on an outer side of the inner leg, the main body and the frame being adapted to be integrated as the first protrusion is fitted to the first recessed portion,

each of the end caps including a pair of end legs each constituting an end portion, as viewed in the linearly moving direction, of the leg portion, and an end cap horizontal portion constituting an extreme end portion, as viewed in the linearly moving direction, of the horizontal portion, each of the end legs having an outside groove of the direction changing path

provided on a frame side of the end leg, and

wherein the slider includes a filler disposed in a boundary portion between the main body and the frame and a boundary portion between the frame and each of the end caps.

5           2.     The linear guide apparatus according to claim 1, wherein a longest outside dimension in a slider-widthwise direction between end portions, each lower than the first recessed portion, of both inner legs of the main body is greater than a shortest dimension in the slider-widthwise direction  
10   between the first protrusions of the frame.

          3.     The linear guide apparatus according to claim 1, wherein the frame and the end caps are fixed to the main body with screws.  
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          4.     The linear guide apparatus according to claim 1, wherein the frame and the end caps are fixed with each other by a welding.

20           5.     The linear guide apparatus according to claim 1, wherein the main body horizontal portion has a second recessed portion in a central portion in the slider-widthwise direction of an upper surface, each of frame horizontal portions has a third recessed portion continuing to the second recessed portion  
25   of the main body horizontal portion, and each of end caps has

a fourth recessed portion formed on a frame side of the end cap horizontal portion, and wherein the slide further has a top cover having a cover portion being fitted to the second recessed portion of the main body horizontal portion and a pair  
5 of cover leg portions each being fitted to the third recessed portion of the frame horizontal portion, each of the cover leg portions having a second projection being formed on an end cap side of the cover leg portion and being fitted to the fourth recessed portion of the end cap horizontal portion.

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6. The linear guide apparatus according to claim 5, wherein the frame and the end caps are fixed to the main body with screws.

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7. The linear guide apparatus according to claim 5, wherein the frame and the end caps are fixed with each other by a welding.

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8. A method for assembling a linear guide apparatus according to claim 1, the method comprising:

inserting the inner legs of the main body into the frame from the frame horizontal portion side;

fitting the first projections of the frame to the respective first recessed portions of the main body while the  
25 frame undergoes elastic deformation;

fixing the end caps to opposite ends, as viewed in the linearly moving direction, of the main body through the frame; and

disposing a filler in a boundary portion between the main body and the frame and a boundary portion between the frame and each of the end caps.

9. The method for assembling a linear guide apparatus according to claim 8, wherein the fixing step includes inserting male screws in through holes respectively formed in the frame horizontal portions and the end cap horizontal portions, and threadedly engaging the male screws with internal threads formed in opposite end faces, as viewed in the linearly moving direction, of the main body horizontal portion.

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10. The method for assembling a linear guide apparatus according to claim 8, wherein the fixing step includes inserting second projections, each having a welding allowance and being formed one of an end cap side face of each frame horizontal portion and a frame side face of each end cap horizontal portion, in through holes, each being formed on the other of the end cap side face of each frame horizontal portion and the frame side face of each end cap horizontal portion, and allowing the synthetic resin forming each second projection to plastically flow to a gap between the second projection and the through

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hole so that the end caps are fixed to the frame.